

Description of a new species of *Bryconamericus* (Teleostei, Characidae) from the basin of the Golfo de Paria, northeastern Venezuela

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Abstract: The new fish species *Bryconamericus lassorum* is described from the basin of the Golfo de Paria, northeastern Venezuela. It can be distinguished from other species of *Bryconamericus* by the possession of a foramen on the maxilla, located adjacent to the anterior tooth-bearing bone, by the presence of a large, elongate apophysis on the orbitosphenoid, and by the insertion of the proximal and radial components of the dorsal fin pterygiophores between the neural spines of the 13-19th vertebrae.

Key words: Characiformes, tropical fish, Venezuela, *Bryconamericus*.

Bryconamericus is a speciose and complex genus of the family Characidae, widely distributed in Central and South America (Román-Valencia, 2000a). Species of the genus are abundant both in small brooks and on the banks of larger running waters, with high concentrations of dissolved oxygen (ca. 8 mg/l) and almost neutral pH (Román-Valencia, 1998, 2000a, b, in press). Seven valid species are recognized for Venezuela (*B. alpha*, *B. breviceps*, *B. cismontanus*, *B. heretesthes*, *B. loisae*, *B. motatanensis* and *B. meridae*) being the genus distributed throughout all the areas of the country (Román-Valencia, 2000a). The purpose of this paper is to describe a new species of *Bryconamericus* from Venezuela.

METHODS AND MATERIAL

Measurements on 14 specimens were made with digital calipers to 0.01-mm precision, and expressed as percentage of the standard (SL) and head lengths (HL) (Table 1). Fin-ray, scale and teeth counts were made with the aid of a stereomicroscope, a dissecting needle and, occasionally, methyl blue staining solution. Measurements and counts were taken on the left side, except when that side was too damaged. Counts and measurements were recorded following the methodology described in Vari & Siebert (1990).

Observations of cartilage and bone were made on two cleared and stained specimens following the modifications by Song & Parenti (1995) of the method outlined in Taylor & Van Dyke (1985).

Bone nomenclature follows Weitzman (1962) and Vari (1995). Specimens were compared with type and non-type material deposited in the following institutions: Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá (ICNMNH), Field Museum of Natural History, Chicago (FMNH), Laboratorio de Ictiología, Departamento de Biología, Universidad del Quindío, Armenia, Colombia (IUQ), Museo de Biología, Instituto de Zoología Tropical, Universidad Central de Venezuela, Caracas (MBUCV), Museo de Historia Natural La Salle, Caracas, Venezuela (MHNLS), and Division of Fishes, National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM).

The 22 morphometric characters examined in this study (Table 1) were submitted to a principal component analysis (PCA), using the computer software SPAD-Windows version 3.21. An analysis of variance of some morphometric characters for the new species, *B. ichoensis*, and *B. multiradiatus*, was carried out using the computer software Statgraphics version 2.6-DOS.

Comparative material. *Bryconamericus alpha*: FMNH 56647, one paratype; Colombia, Villavicencio, 1913; González. – *Bryconamericus beta*: FMNH 56649, one paratype; Colombia, Villavicencio, 1913; González. – *Bryconamericus breviceps*: USNM 120274 syntypes, two specimens; Brazil, Rio Gotaz, senhor Honorio, 1865. – *Bryconamericus motatanensis*: USNM 121479 paratype, ten specimens; Venezuela, lago de Maracaibo basin, Rio Motatan 4 Km arriba de Motatan; 25 March 1942; L.P. Schultz. USNM

Table 1. Morphometric and meristic data of *B. lassorum* n. sp. Standard and total lengths in mm. Mean values within parentheses.

Morphometric:	Paratype n= 13	Holotype
Standard length (mm)	24.94-35.56 (31.06)	33.01
Total length	32.23-44.17 (40.47)	41.00
Percentages of SL:		
1. Body depth	28.10-33.41 (29.89)	29.81
2. Snout-dorsal fin distance	52.27-55.74 (53.78)	54.56
3. Snout-pectoral fin distance	22.45-28.73 (26.46)	27.29
4. Snout-pelvic fin distance	44.83-48.61 (46.25)	46.23
5. Snout-anal fin distance	57.57-62.07 (59.24)	59.25
6. Dorsal fin-hypurals length	46.86-55.17 (49.40)	46.91
7. Dorsal fin -pectoral fin length	37.21-42.60 (40.68)	40.96
8. Dorsal fin-anal fin length	28.61-33.44 (31.28)	31.02
9. Dorsal fin length	22.34-26.79 (24.55)	23.36
10. Pectoral fin length	21.28-26.91 (24.05)	24.05
11. Pelvic fin length	14.96-19.69 (17.39)	17.90
12. Anal fin length	17.08-20.92 (19.63)	18.42
13. Caudal peduncle depth	7.95-10.48 (9.35)	9.02
14. Caudal peduncle length	6.38-10.95 (8.12)	7.85
15. Head length	22.76-24.61 (23.63)	23.45
Percentages of HL:		
16. Snout length	24.58-31.63 (27.59)	25.45
17. Postorbital distance	33.33-39.07 (35.69)	34.33
18. Orbital diameter	33.44-49.27 (43.88)	40.05
19. Maxilla length	16.34-25.32 (22.63)	24.32
20. Upper jaws length	26.52-36.47 (30.69)	28.04
21. Interorbital distance	32.17-37.12 (34.92)	33.17
Meristic:		
Lateral-line scales	35 - 36	36
Scale rows between dorsal-fin origin and lateral line	5-6	5
Scale rows between anal-fin origin and lateral line	5-6	5
Scale rows between pelvic-fin origin and lateral line	4-5	4
Predorsal median scales	-	-
Dorsal-fin rays	iii,7	iii,7
Anal-fin rays	v,25-26	v,26
Pelvic-fin rays	ii,6	ii,6
Pectoral-fin rays	ii,9-10	ii,9

121478, paratype, 74 specimens; Venezuela, Río Motatan system, Río San Juan at bridge south of Mene Grande; 20 March 1942; L.P. Schultz. - IUQ 394 (before MBUCV 7416), 30 specimens; Venezuela, estado Portuguesa, Río Portuguesa system, Río Las Marias in Guanare; 26 September 1973; Mago F, O. Silva, H. López, A. Machado, L. Aguiar. - *B. multiradiatus*: ICNMMNH 82, Holotype; Colombia, Departamento del Chocó, municipio de río Sucio, cuenca río Atrato, Río Sucio; 8 September 1959; G. Dahl. ICNMMNH 4911, four specimens; Colombia, Departamento del Chocó, municipio de Río Sucio, Río Atrato; 8 septiembre 1959; G. Dahl. ICNMMNH 1568, 15 specimens; Co-

lombia, Departamento del Chocó, municipio de Quibdó, Río Atrato, caño ciénaga de Ipurrú en San Antonio de Padua; 24 September 1988; C. Román-V. & E. Puentes.

RESULTS

Bryconamericus lassorum new species

(Table 1; Figs. 1-5)

Holotype. MNHLS 9407, Collected by V. Ponce, C. Colonnella, and M. Curvelo; Venezuela, Monagas State, stream El Caño, 10 km from



Fig. 1. *Bryconamericus lassorum* n. sp., holotype, 33.01 mm S, female, MNHLS 9407, Venezuela, El Caño, 10 km from Aragua to Maturin, Golfo Paria basin, Rio Guarapiche system, San Juan.

Aragua to Maturin, Rio Guarapiche-San Juan system, Golfo de Paria basin ($9^{\circ} 55' 10''$ N & $63^{\circ} 24' 53''$ W) 13 February 1991.

Paratypes. 11 specimens collected with the holotype: MNHLS 14424. - two specimens collected with holotype (C & S): MNHLS 14424.

Diagnosis. *Bryconamericus lassorum* is readily distinguished from its congeners by the maxilla having a foramen located adjacent to the tooth-bearing anterior border of the bone (Fig. 2), by an undivided parasphenoid, by an orbitosphenoid with a large, elongate apophysis (Fig. 3), and by the proximal and radial components of the dorsal fin pterygiophores located between neural spines 13-19.

Description. Body short and robust. Dorsal profile of head oblique; area above orbits convex. Dorsal profile of body curved from supraoccipital to dorsal fin origin, slightly oblique from last dorsal fin ray to caudal fin base. Ventral profile of body convex from snout to anal fin base, convexity more pronounced beyond posterior part of pectoral fins. Greatest body depth anterior to dorsal fin origin. Caudal peduncle laterally compressed in all specimens. Head and snout short; jaws equal, mouth terminal; lips soft and flexible, not covering external tooth row of premaxilla; ventral border of upper jaw slightly concave; maxilla ending posteriorly at level of anterior border of orbit. Right and left nostrils proximate; opening of posterior nostrils vertically ovoid; opening of anterior nostrils with posterior membranous flap. Eyes without membranous covering.

Four infraorbital bones present, all with laterosensory canal; third infraorbital long, wide,

with ventral and posterior borders in contact with preopercle. Supraorbital absent. Premaxilla with short lateral process and two rows of teeth; outer row with 4-5^{*}tricuspidate teeth arranged in straight line. Inner row with four teeth pentacuspide, with central cuspid slightly larger. Maxilla short with posterior tip not reaching anterior border of second infraorbital. Maxilla with 3-4 teeth, pentacuspide, with central cusp slightly larger, teeth located on anterior and ventral margins of bone; maxilla with a foramen located adjacent to anterior border of tooth bearing bone. Dentary with four large teeth followed by four small teeth. All dentary teeth pentacuspide, with central cusp slightly larger. Dentary joined to articular through three apophyses.

Rhinosphenoid separated posteriorly from orbitosphenoid by mesethmoid cartilage. Orbitosphenoid with short, wide apophysis present. Parasphenoid slender and undivided. Mesethmoid cartilage contacting dorsal and lateral margins of rhinosphenoid and extending to anterior extreme of parasphenoid. Anterior portion of parasphenoid covering posterodorsal surface of vomer; posterior portion of parasphenoid in contact with prootic and basioccipital. Nasal bones present. Dorsal fin margin rounded, second ray simple and first two branched rays longest. Radial and proximal components of all dorsal fin pterygiophores inserted between neural spines 13-19; proximal radials keeled. Five supraneurals between head and anterior dorsal fin. Lower extreme of bones projected between neural spines. Dorsal fin proximal radials wide, with keel present.

Pectoral girdle with a sharp dorsal process on cleithrum, reaching 2/3 of supracleithrum. Cleithrum long, located at level of posterior middle

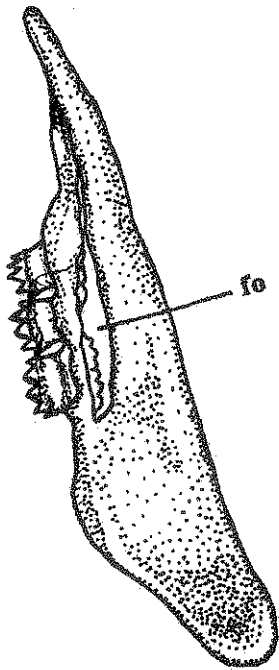


Fig. 2. Left maxilla of *Bryconamericus lassorum* n. sp. indicating the foramen (fo). Scale bar: 1 mm.

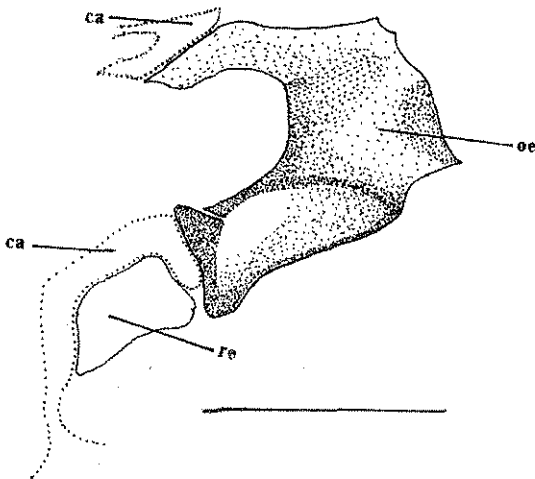


Fig. 3. Orbitosphenoid (oe), rhinosphenoid (re), and cartilage (ca) of *Bryconamericus lassorum* n. sp. Scale bar: 1 mm.

part of opercle. Ten proximal radials. Pelvic fin margin rounded, with top of fin reaching anal fin origin. Pelvic bone an elongated structure located parallel to belly; pelvic bone tip not straight; ischiac process a short structure, not straight, with two apophyses on posterior edge.

Anterior four anal fin pterygiophores inserted after third caudal vertebral spine. First pterygiophore associated with first four anal rays. Anal fin with 1-2 scale rows covering base of anal-fin rays. Caudal fin bifurcated with large lobus ending in filaments or pointed tips. Caudal-fin rays 5-7/8-9. Caudal fin unscaled. With 35-36 pored lateral line scales, extending from supracleithrum to hypural joint. Lateral line pores forming slight curve between first and fourth scale with rest in straight line. Total vertebrae 37.

Secondary sexual dimorphism. Males with row of short bent hooks on each ray segment of pelvic and anal fins. Branched anal fin rays 1 to 8 with spines, spines on rays 3 to 8 placed on branched segment. All branched pelvic fin rays with 16-18 spines on basal two thirds.

Color in alcohol. Taken primarily from type material. Background body color brown to yellow-brown. Dark band visible on lateral surface of body from opercle to caudal peduncle. A dark vertically elongate humeral blotch present posteriorly to opercle at level of lateral line. Region dorsally to lateral line more darkly pigmented than ventral region of body. Intense brown chromatophores on upper and lower jaws. Chromatophores on caudal fin more intense.

Comparisons. *Bryconamericus lassorum* is similar to *B. ichoensis*, but differs in the position of the insertion of the pectoral fin (22.45-28.73 % of SL, n=14 in *B. lassorum*; 27.39-32.39 % of SL, n=11 in *B. ichoensis*; analysis of variance $F = 4.27$; $p = 0.05$), in the head length (22.76-24.61% of SL, n=14 in *B. lassorum*; 25.86-29.76 % of SL, n=11 in *B. ichoensis*; analysis of variance $F = 6.65$; $p = 0.05$), in the length of the maxilla (24.56-34.79 % of HL, n=14 in *B. lassorum*; 22.76-24.61% of HL, n=11 in *B. ichoensis*; analysis of variance $F = 31.27$; $p = 0.05$) and in the number of branched anal fin rays (25-26 in *B. lassorum*; 27-30 in *B. ichoensis*) (Table 1, and Román-Valencia, 2000b). The Principal Component Analysis (Fig. 4) indicates that the two taxa differ on axis 1 by the anal and pectoral fin origin position. On axis 2 they differ by the maximum body depth, length of the maxilla, length of the caudal peduncle, and by the dorsal fin rays. The first component explains 75.15% of total variance, and the first

Component 2

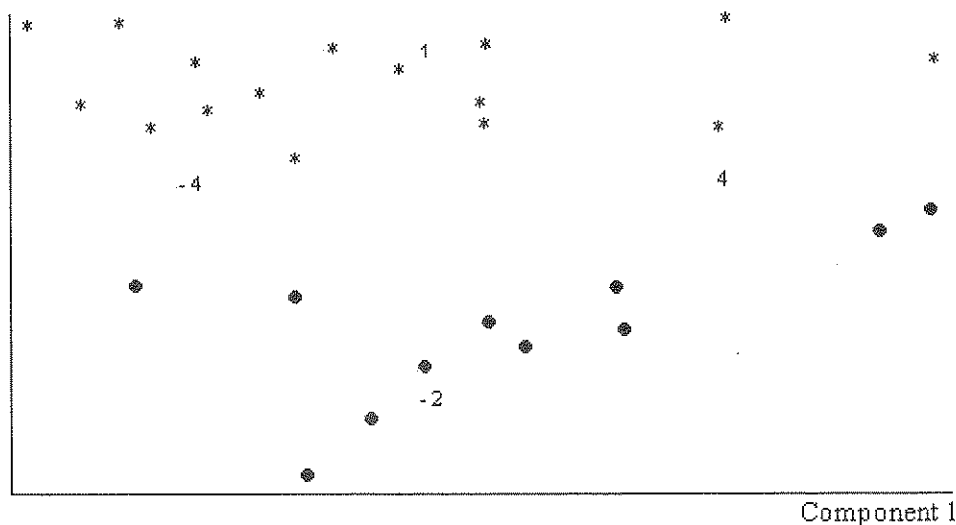


Fig. 4. Representation of the two principal components of the morphometric data (PC1 on axis X, PC2 on axis Y) for *B. lassorum n. sp.* (dots) and *B. ichoensis* (asterisks).

Component 2

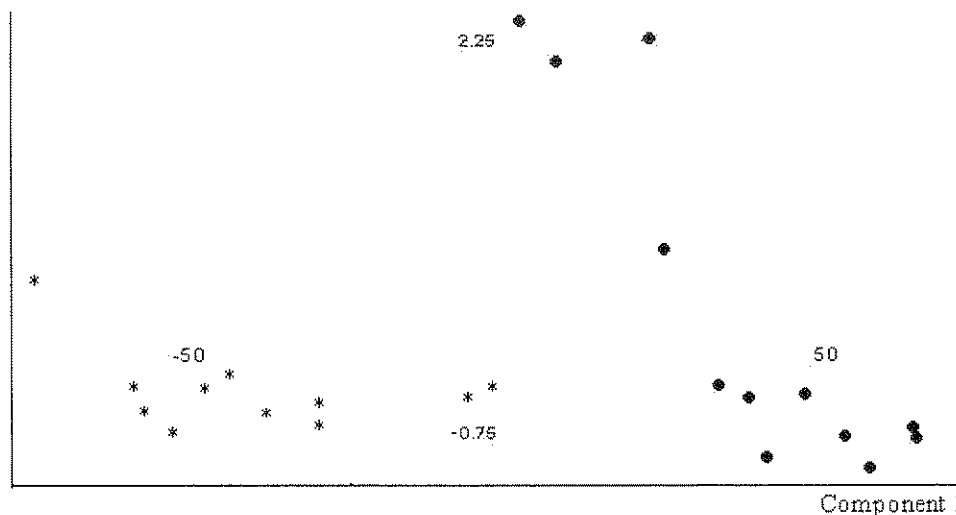


Fig. 5. Representation of the two principal components of the morphometric data (PC1 on axis X, PC2 on axis Y) for *B. lassorum n. sp.* (asterisks) and *B. multiradiatus* (dots).

and second component jointly explain 82.43% of the total variance.

Bryconamericus lassorum is also similar to *B. multiradiatus*. It differs in body depth (28.10-33.42, mean 29.89 % of SL, n=14 in *B. lassorum*; 20.93-27.58, mean 24.52 % of SL, n=20 in *B.*

multiradiatus; analysis of variance $F = 70.06$; $p = 0.05$), and in dorsal to anal fin distance (28.61-33.44, mean 31.28 % of SL, n=14 in *B. lassorum*; 21.48-28.62, mean 25.44 %, n=20 in *B. multiradiatus*; analysis of variance $F = 75.72$; $p = 0.05$). The Principal Component Analysis (Fig. 5)

shows that these two taxa differ on axis 1 by the dorsal fin position in relation to the anal fin, and by the head length. On axis 2 they differ by the dorsal and pelvic fin lengths, by the caudal peduncle length, and by the distance between the snout and the pectoral fin origin. The first component explains 85.99 % of total variance, and the first and second components jointly explain 91.79 % of total variance.

Etymology. The species is named after the Spanish ichthyologists Carlos Lasso and Oscar Lasso-Alcalá (MHNLS), in recognition for their contributions to the study and preservation of Neotropical fish.

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